Laboratoire interdisciplinaire d'évaluation des politiques publiques

LIEPP Working Paper

October 2013, nº17

Fighting Crime with a Little Help from my Friends: Party Affiliation, Inter-jurisdictional Cooperation and Crime in Mexico

Ruben Durante

Sciences Po – LIEPP / Sciences Po - Department of Economics / Yale University

ruben.durante@sciencespo.fr

and

Emilio Guterriez

Centro de Investigación Económica – ITAM-CIE

emilio.gutierrez@itam.mx

Sciences Po | LIEPP
27 rue Saint-Guillaume
75337 Paris Cedex 07
Tel : 01 45 49 83 61
www.sciencespo.fr/liepp

Fighting Crime with a Little Help from my Friends: Party Affiliation, Inter-jurisdictional Cooperation and Crime in Mexico *

Ruben Durante† Emilio Gutierrez‡

October 19, 2013

ABSTRACT

We investigate the relationship between inter-jurisdictional cooperation and law enforcement in Mexico. Exploiting a Regression Discontinuity Design in close municipal elections, we study how improved opportunities for cooperation in crime prevention among neighboring municipalities - proxied by their degree of political alignment - may result in lower rates of violent crime. We find that municipalities in which the party in power in the majority of neighboring jurisdictions barely won experience significantly lower homicide rates during the mayor's mandate than those in which it barely lost. This effect is sizeable and independent of which party is in power in the neighboring municipalities.

*We thank Pedro Dal Bó, Roberto Galbiati, Emeric Henry, Brian Knight, Jens Ludwig, Cesar Martinelli and Daniel Mejía for helpful comments, and seminar participants at Universidad de Los Andes and ITAM as well as participants at the 2013 meeting of the LACEA America Latina Crime and Policy Network for helpful discussion. We are grateful to Patrick Signoret, Carlos Farah, and Etienne Fize for excellent research assistance. Ruben Durante is grateful to the Interdisciplinary Center for Public Policy Evaluation (LIEPP) at Sciences Po for financial support.

†Sciences Po and Yale University. Contact: Ruben.Durante@sciences-po.org.

‡ITAM-CIE. Contact: Emilio.Gutierrez@itam.mx.

«[Mexican] municipal police forces...are also among the least effective:
the patchwork of command muddles operations.
In Monterrey the metropolitan area alone has eleven different forces,
using different training, tactics and even brands of radio.
"If a criminal crosses the street he has reached a safe haven," admits one official»

The Economist, October 14th 2010

1. INTRODUCTION

The literature on federalism has traditionally focused on the fundamental trade-off between the capacity of a decentralized system to tailor policies to local preferences, and that of a centralized one to properly internalize inter-jurisdictional spillovers (Oates, 1977, 1999; Gonzalez-Navarro, 2008; Knight, 2011).[1]

One aspect that could potentially alter the terms of this trade-off concerns the possible synergies from *horizontal* inter-jurisdictional cooperation, that is, between jurisdictions of the same administrative level. When spatial spillovers are present, systematic cooperation among local authorities can make local provision of public goods more effective, whereas the lack of it can exacerbate the inefficiencies associated with decentralization.

One area in which this aspect is particularly relevant is law enforcement: in the context of a fragmented public security system, better coordination and information sharing among local police forces can favor effective crime reduction efforts. Indeed, the potential benefit from inter-jurisdictional cooperation, and the implications for the efficient organization of the administration of justice, have been extensively discussed in both the criminal justice and the public administration literature (McDavid, 1974; Ostrom et al., 1978; Parks, 2009), but have been largely disregarded by economists. One noticeable exception is represented by Loeper's recent theoretical contribution on inter-jurisdictional coordination in federal systems (2011).

[1] For a thorough discussion of alternative models of federalism, of the concept of federal governance and its relation with economic performance see respectively Inman and Rubinfeld (1997) and Inman (2007).

[2]

In this paper we investigate the relationship between horizontal inter-jurisdictional cooperation and the effectiveness of law enforcement in the context of Mexico, where crime incidence has steadily increased over the past decade, and an animated debate about the need for better coordination among local police forces is ongoing. In particular, we apply a Regression Discontinuity Design (RDD) in close local electoral races to study how improved cooperation among neighboring municipalities, proxied by the degree of political alignment between mayors, can improve crime deterrence and result in lower crime rates, with particular regard to homicides.[3] Our identification strategy relies on the assumption that, if random factors - e.g. unexpected breaking news, weather conditions on election day, etc. - have an (even small) impact on electoral outcomes, the victory of the candidate of the party that controls the majority of neighboring municipalities would mimic random assignment in elections decided by a narrow margin. Such RDD set-up therefore delivers a (local) source of exogenous variation in political alignment with neighbors, which, we argue, should facilitate cooperation in law enforcement.

Using this approach, we find that municipalities where the candidate of the party in power in the majority of neighboring municipalities won by a small margin experienced significantly lower homicide rates during that mayor's mandate than comparable municipalities in which that party barely lost. The effect is sizeable - a decrease in homicide rates of 35 to 43% - and appears to be independent of which party is in power in the neighboring municipalities. Reassuringly, political alignment with neighbors does not appear to be correlated with a variety of other outcomes, including crime incidence before the election. That improved horizontal cooperation is driving this result, is further supported by the fact that the documented reduction in crime is increasing in the share of same-party neighbors, and is not explained by

[2] While Loeper's argument refers to the case of a pure coordination game and focuses on the external cost for a jurisdiction to choose a policy different from that chosen by others, his framework does not allow for actual cooperation and does not take into account the spatial dimension of it, that is, that cooperation with neighbors may be more valuable than cooperation with non-neighbors.

[3] The underlying assumption, discussed below, is that it is easier to achieve cooperation between mayors of the same party than between mayors of competing parties.

political alignment with state or federal authorities.

Our paper relates to various streams of literature. First and foremost, our work contributes to the literature on decentralization in federal systems by providing novel evidence that, in the presence of geographical spillovers, inter-jurisdictional cooperation can result in more effective provision of local public good. Although our findings are specific to the area of law enforcement and public security, we believe that some of the insights from our analysis can apply to other areas of public policy involving inter-jurisdictional spillovers.

Our contribution is also related to the literature on the role of coordination in the implementation of crime-reducing policies: while previous contributions have focused on coordination between local and federal police (Dell, 2011), or between different police forces at the federal level (Soares and Viveiros, 2010), we focus on horizontal coordination between local police forces operating in geographically distinct locations, an aspect which economists have largely disregarded or examined only indirectly (Wheaton, 2006).

Our work also relates to previous studies on the importance of political alignment (Dell, 2011; Brollo and Nannicini, 2011); while these contributions focus on the impact of political alignment between local and central authorities - on drug-related crime deterrence in Mexico and on federal transfers to municipal government in Brazil respectively - we look at the effect of political alignment between jurisdictions of the same administrative level.

Finally, from a methodological perspective, our approach is close to that of other studies that have used a regression discontinuity design to examine the impact of party affiliation on a variety of political and non-political outcomes (Lee, 2001; Lee et al., 2004b; Dal Bó et al., 2009; Pettersson-Lidbom, 2008).

The remainder of the paper is organized as follows. Section 2 provides background information on the Mexican political and institutional system. Section 3 describes the data used in the empirical analysis. Section 4 illustrates the empirical strategy and presents the main findings which are further discussed in section 5. Section 6 concludes.

2. BACKGROUND ON MEXICO

The Mexican context is particularly well-suited for an empirical analysis of the impact of cooperation among local police forces on crime for a variety of reasons. Homicide rates in Mexico have sharply increased in recent years. As displayed in Figure 1 - which shows the evolution of the number of monthly homicides recorded in the country since 2000 - while until 2006 the incidence of homicides remained relatively constant (around 1,000/month), since 2007 the number of homicides has steadily increased, reaching more than 2,000/month by the end of 2010. This unprecedented surge in violent crime in Mexico has made the object of a growing literature in social sciences to which this paper attempts to contribute.

Most observers view the increase in homicides as a direct consequence of the federal government's strategy against drug-related organized crime, which has been primarily focused on neutralizing drug cartel leaders, resulting in increased violent conflict among smaller gangs for the control of the territory (Guerrero-Gutiérrez, 2010; Dell, 2011). This paper does not attempt to identify the causes of the observed increase in violent crime but, rather, to shed light on whether better coordination among local polices can be instrumental to its containment.

Indeed, poor coordination can be especially problematic in the context of Mexico's highly fragmented security apparatus,[4] in which the investigation and prosecution of homicides is the responsibility of local police forces. We focus, in particular, on the role of municipal police which accounts for about 40% of Mexican total law enforcement officers.(Guerrero-Gutiérrez, 2010) Each municipal police department operates under the direct control of the municipality government. The mayor - who is elected every three years - has considerable influence over the selection of local police chiefs and, more in general, over the organization of the police department. Indeed, the mayor's party affiliation can have a considerable impact

[4] Sabet (2012) estimates that there are about 3,000 different police forces at the municipal, state and federal level in Mexico.

on the functioning, priorities, and policing style of municipal forces.[5] More important, in the context of Mexico's highly polarized political landscape, heterogeneity in party-affiliation between mayors of neighboring municipalities can aggravate the lack of inter-jurisdictional cooperation and has, in some instances, even resulted in actual confrontations between different local police forces (Davis, 2006; Tapia, 2009a,b).

It is hence not surprising that an animated debate on the opportunity of reforming the current organization of Mexican police has emerged among Mexican policy-makers, including at the highest level. In October 2010, for example, the then President Felipe Calderón Hinojosa proposed a bill for the creation of a Single-Command National Police Force,[6] motivated by the need to foster coordination and increase homogeneity in the operation of local police forces. [7] With a similar motivation, since 2011 the National Conference of Mexican Governors (CONAGO, a periodic summit of Mexican State governors) has implemented regular cooperative efforts aimed at reinforcing information sharing among local police forces engaged in operations against crime.[8] While these initiatives have not yet been rigorously evaluated, they indicate that local authorities recognize the need for better coordination as an instrument to combat crime in a more effective way.

Recent academic contributions on violence in Mexico have also discussed the importance of cooperation among police forces. In particular, Dell (2011) presents evidence on the impact

[5] A curios example of how the mayor's party affiliation can impact even the most basic aspects of local police organization - such as equipment purchases - is reported by Sabet (2012): "PAN administrations argue that police the world over wear blue uniforms and therefore issue uniforms and vehicles in blue. However, blue happens to be the color of the PAN party, and PRI governments have tried to emphasize other colors. When PRI Hank Rhon came to office in Tijuana in 2004 after fifteen years of PAN rule, he gave the police new black uniforms, repainted the police cruisers black, and created a new emblem for the police. Hank Rhon sold the action as symbolic of a new police force that was making a break from the past and reinventing itself, but the partisan undertone was unmistakable. When the PAN returned to office in 2007, they reversed the previous administration's changes, issued new blue uniforms, painted the patrol cars blue, and returned to the old police emblem. Mexicali's PAN administration repainted the city's black-and white cruisers blue when it came into office in 2007. Hermosillo's new PRI government, on the other hand, chose to paint the formerly blue police cars orange, a color they argued is the color of Hermosillo and not of any political party."

[6] A similar measure has been recently proposed by the new president, Enrique Peña Nieto.

[7] Further details on the bill are available at http://www.presidencia.gob.mx/iniciativas-de-ley/mando-unico-policial/.

[8] Further information is available at: www.conago.org.mx.

of improved coordination between federal and local police on drug-related crime and finds that improved opportunities for cooperation between local and federal governments (proxied by the degree of political alignment) result in a *higher* number of drug-related homicides. However, to the best of our knowledge, no previous empirical study has attempted to measure the impact of improved horizontal cooperation among local police forces.

Before moving to the empirical analysis we provide additional details on the Mexican institutional and political context. Mexico is a multi-party competitive democracy with three major political parties disputing most of the positions at stake in local and federal elections: the Institutional Revolutionary Party (PRI), the National Action Party (PAN), and the Party of the Democratic Revolution (PRD). With regard to the parties' ideological position, while PAN is right-to-center and PRD left-to-center, PRI is generally considered as centrist. While federal and state elections are held every six years, municipal elections are held every three years with all the municipalities in a state voting at the same time. In both local and federal elections the three major parties - particularly PRI and PRD - generally form coalitions with smaller parties, although in the vast majority of these cases, the coalition candidate is drawn from the major party. It is hence very likely that when the coalition led by one of the major parties prevails in two neighboring municipalities, the elected mayors will belong to the same party.[9]

The existence of a positive relationship between party alignment and inter-jurisdictional cooperation is crucial to our approach and is based on the assumption that mayors affiliated to the same party will be more prone to encourage cooperative behavior by their respective municipal police departments. This could simply be due to closer personal connections between fellow party members operating in the same area, or to shared views regarding crime-reduction strategies and priorities. Party discipline is also likely to play an important role; indeed, it is important to note that mayors, like all elected officials in Mexico, cannot run for

[9] In some (rather uncommon) cases, two of the major parties may join the same electoral coalition. Since in these instances inferring the party affiliation of the elected mayor (and the degree of political alignment with neighboring mayors) is rather difficult, we prefer to exclude these cases from our analysis.

immediate re-election; hence, they have strong incentives to earn the confidence and good graces of higher level party leaders who influence future nominations and appointments for higher offices (Sabet, 2012; Guillén López, 2006).

3. DATA

The data used in our empirical analysis come from a variety of sources. Detailed geographic information on Mexico's administrative divisions is available from the Mexican Institute for Statistics and Geography (INEGI). Using these data, we identify for each municipality a set of neighbors, defined as those municipalities sharing a boundary. Electoral data for the municipal elections held since 2000 are available from the Mexican Research Center for Development (CIDAC). As mentioned, Mexican municipalities hold elections every three years to renew their local authorities. While all municipalities in a state vote in the same year, municipalities in different states may hold elections in different years. Table 1 reports, for each state, the election year for which electoral data are used. For each municipality the data include the total number of votes cast, and those attributed to each party. For every election we identify the two parties with most votes and compute the gap in vote share between the winner and the looser. From the outcome of the previous election, we identify the incumbent's party affiliation. Figure 2 represents the distribution of the ruling party's identity across Mexican municipalities in 2008. While some areas are largely controlled by a single party, there is considerable spatial heterogeneity in party's influence both across and within regions. Using this information, we compute, for each municipality, the share of neighboring municipalities controlled by each of the three main parties at the time the mayor took office. [10]

As our main outcome of interest we consider the number of homicides in each municipality in the three years (before and) after the relevant election. Homicide statistics, available

[10] While for neighboring municipalities within the same state we consider the party of the mayor elected in the same electoral cycle, for out-of-state neighbors which did not hold elections in the same year, we consider the party in power at the time of the election.

from INEGI, are derived from official administrative records and include the total number of homicides recorded each year in a municipality between 2000 and 2010 (Figure 1). We combine these data with information on municipalities' total population in 2005 - also available from INEGI - to calculate the yearly homicide rate in a municipality defined as the number of homicides per 100,000 inhabitants.

Finally, we also use data on a variety of socio-economic variables at the municipal level which we include as controls in our regressions. Data on death rate, adult literacy rate, share of households with access to sewage, electricity, or running water, school attendance for children aged 6 to 24 are available from the 2005 INEGI population count (Conteo de Población y Vivienda). Data on infant mortality rate, human development index, and the share of female politicians are available from the United Nations Development Program (UNDP).

Table 2 reports descriptive statistics for all the variables mentioned above separately for the full set of Mexican municipalities, and for the restricted sample of municipalities used in our empirical analysis. Some differences in observed means between the restricted sample and the rest of Mexican municipalities are statistically different from zero. These include: winning party's and incumbent party's identity, area, and other socio-economic indicators such as infant mortality rate, human development index and share of households with no access to sewage. Although these differences in observables may question the external validity of the estimates presented below, to the extent to which our empirical strategy correctly exploits exogenous variation in mayors' party affiliation, our findings on the relationship between political alignment across neighbors and the evolution of homicide rates should be valid for the municipalities in our sample.

4. EMPIRICS

4.1. EMPIRICAL STRATEGY

Our empirical analysis aims to investigate whether improved cooperation among Mexican municipal police forces - proxied by the degree of political alignment of the respective mayors - is associated with lower levels of violent crime. One way to test this hypothesis is by simply comparing homicide rates between municipalities that are politically aligned with their neighbors and municipalities that are not. However, this procedure is likely to deliver a biased estimate of the causal impact of political alignment on crime-related outcomes since, for example, local political preferences may themselves be affected by crime levels. To isolate the causal impact of political alignment on homicide rates, we employ a regression discontinuity design (Imbens and Lemieux, 2008; Lee and Lemieux, 2009); in particular, following previous studies on the impact of party identity on various socio-economic outcomes (Dell, 2011; Lee et al., 2004a), we exploit the arguably exogenous discontinuity in the identity of the ruling party in a municipality given by its victory in a close election.

Since we are interested in the degree of political alignment between a given municipality and its neighbors, we look at those municipalities for which at least 50% of the neighboring municipalities were governed by the same party, and, among these, focus specifically on those municipalities in which the party governing the majority of neighbors won or lost by a small margin (5% or less).

Around the discontinuity, our argument goes, municipalities in which the party ruling in most of the neighbors barely won would experience an exogenous shock in their capacity of cooperating with neighbors. Figure 3 illustrates the basic intuition behind our identification strategy by mean of an example. The figure depicts two municipalities in the state of Veracruz holding local elections in 2007: Samahil (shaded red area) and Timucuy (shaded blue area). Both municipalities share a border with five other municipalities, three of which were governed by the PRI, one by the PAN, and one by a minor party. However, while in

Timucuy the PAN won over the PRI by a small margin, in Samahil the PAN lost to the PRI by a similarly small margin. Our identification strategy is based on the comparison of post-election homicide rates between ex-ante similar municipalities some of which - like Samahil - became politically aligned with the majority of their neighbors and others - like Timucuy - that did not.

Figure 4 graphically summarizes our analysis. We take the set of municipalities for which at least 50% of the neighbors is governed by one party and divide them into 50 bins, each representing a 0.2-percentage-point difference in vote share between the party governing the majority of neighbors and its closest competitor (defined as vote spread in the figure). This variable is positive if the party governing the majority of neighbors won the election in the municipality and negative if it lost it. We then define a dummy variable indicating whether the homicide rate recorded in the municipality in the three years after the relevant election is above the national median, and regress it on all the control variables introduced above. Finally, we plot the average residual of this regression against the vote spread. As depicted, while the average homicide rate tend to increase with the vote spread, there is a significant decrease in the share of municipalities with above-median post-election homicide rate right at the point in which the vote spread becomes positive, that is, when the party in power in the majority of neighbors won the election. In line with our identification strategy, this drop can be interpreted as the causal effect of an increase in political alignment on post-election homicide rates. In figure 5 we replicate this exercise using as dependent variable the dummy variable indicating whether the homicide rate was above the national median in the previous mandate, and find no evidence of a discrete jump at the discontinuity.

To examine this pattern more formally, and to be able to control for other factors that may affect homicide rates at the local level, we control for a flexible relationship between the vote spread and the homicide rate, through a non-parametric local linear regression on each side of the discontinuity, on the sample of municipalities with at least 50% of neighbors governed by the same party and in which that party won or lost the election by a margin of at most 5%.

Our empirical specification is then:

$$C_{is} = \alpha_0 + \alpha_1 Mwin_{is} + F(Sp_{is}) + \delta X'_{is} + \gamma_s + \varepsilon_{is} \quad (1)$$

where subscript *is* indicates municipality i located in state s; C_{is} is a dummy variable taking value one if the homicide rate in the municipality in the three years after the election is above the national median, or, alternatively, the log of one plus the homicide rate; $Mwin_{is}$ is a dummy variable taking value one if the party governing 50% or more of i's neighbors won the election in municipality i; $F(\cdot)$ is a flexible function of Sp_{is} which is the difference between this party's vote share and that of its closer competitor; and finally X'_{is} is a vector of characteristics of municipality i in state s, including winning party dummies, incumbent dummies, and a variety of socio-economic characteristics. State fixed-effects (γ_s) are included in all the regressions discussed below.

For our empirical strategy to correctly estimate the causal effect of political alignment on homicide rate two key assumption must be satisfied: i) the outcome of interest must vary smoothly with respect to the margin of victory (or loss) of the party governing most of the municipality's neighbors, ii) only the treatment - that party's victory - must have an effect on the outcome of interest at the discontinuity (Caughey and Sekhon, 2011).

To shed light on this aspect, in Table 3 we report the differences in means between observations on each side of the discontinuity for all control variables included in the regressions, and also present the results of simple regression discontinuity analyses (adjusting a linear trend on each side of the discontinuity for the relationship between each outcome analyzed and the vote spread) using each control as dependent variable. The fact that no significant difference in these characteristics is observed between municipalities in which the party ruling the majority of neighbors barely won or lost the election, is reassuring of the fact that the municipalities in the two groups were not dissimilar *ex ante*. As a further robustness check, in what follows we also replicate the analysis using the homicide rates in the three years prior to the relevant election as dependent variable, to confirm that the treatment variable is

not correlated with pre-election crime incidence.

4.2. RESULTS

Given that the distribution of murder rates in our sample is highly skewed (see Figure 6), in the first part of our analysis we consider as dependent variable a dummy indicating whether the murder rate in a municipality is above the national median in the three years after the relevant elections. The results are reported in table 4. In columns 1 and 2 we control for state fixed effects, winning and incumbent party fixed effects; in columns 3 and 4 we also control for death rate, total area, population density, adult literacy rate, the fraction of households with access to sewage, electricity and water, infant mortality rate and human development index. In columns 5 and 6 we control for school attendance rate for individuals aged 6 to 24, and for a variable indicating the fraction of local politicians that are women. In columns 1, 3 and 5 we use the optimal bandwidth for the non-parametric estimates on each side of the discontinuity according to Imbens and Kalyanaraman (2012), while in columns 2, 4 and 6 we reduce the optimal bandwidth to half to explore whether the result is sensitive to a more flexible relationship between the vote spread and the outcome of interest. In all specifications political alignment with neighbors displays a negative and significant coefficient (1% level). Furthermore, the coefficient remains very stable when additional controls are included, and when the bandwidth is reduced. The magnitude of the coefficient ranges between -0.35 and -0.43, which implies that municipalities that are politically aligned with their neighbors are 35 to 43 percent less likely to experience above-median homicide rates than municipalities that are not.

To rule out the possibility that political alignment might be related to pre-existing crime patterns, we replicate the analysis looking, this time, at the effect of political alignment on homicide rates in the three years prior to the election (Table 5). The results provide no evidence of a relationship between pre-election homicide rate and post-election political alignment: in none of the specifications the coefficient of interest is significantly different

from zero. This confirms that politically aligned municipalities experienced a decrease in homicide rate only *after* the party governing the majority of its neighbors had come to power.

The binary nature of the dependent variable used in Table 4 makes it rather hard to interpret the magnitude of the effect of political alignment on homicide rate. To give a better sense of this magnitude, and given the highly skewed distribution of the homicide rate in our sample, in Table 6 we re-estimate equation (1) using the log of one plus the homicide rate after the election as the dependent variable. In Table 7 we report the analogous results for the three years prior to the election. Controls in each column are the same included in Tables 4 and 5. Based on the results in Table 6, we estimate that the improved cooperation resulting from political alignment between a municipality and its neighbors decreases the log of one plus the homicide rate by 0.73 to 1.05. Given the observed mean in homicide rates (45.4/100,000 inhabitants), these coefficients suggest a reduction in murder rates corresponding to a 52 to 65 percent reduction. Once again, political alignment does not appear to be correlated with the murder rate recorded in the three years prior to the election: the estimated coefficients in Table 7 are very close to zero and statistically insignificant.

5. Discussion

The results presented thus far indicate that municipalities that are politically aligned with their neighbors experience significantly lower murder rates than those that are not. Although these findings may be explained by better cooperation among local police forces when mayors of neighboring municipalities belong to the same party, they are also consistent with alternative explanations. For instance, the close election of a mayor from a specific party may have an impact on crime prevention in a municipality for reasons other than better coordination with same-party neighboring mayors, e.g. because crime prevention is a priority for that party, or because it supports more effective anti-crime policies. Alternatively, if the party that governs most of a municipality's neighbors is also in power at the state or federal level, political alignment with neighbors may in fact reflect improved cooperation of mu-

nicipal police with state or federal authorities (as suggested by Dell, 2011) rather than with municipal polices in neighboring jurisdictions.

In this section we present additional evidence of the robustness of our baseline results and test some of these alternative explanations. In particular, we test whether the effect of political alignment: (i) is larger the higher the share of neighboring municipalities governed by the same party (in line with an explanation based on improved inter-jurisdictional cooperation), (ii) is not contingent on the identity of the party winning the election; (iii) is not contingent on the identity of the party in power at the state level; and (iv) is not contingent on the fact that the winning party is the same as the incumbent.

To test these hypotheses, we turn to a parametric estimation, restricting the sample to municipalities for which the party governing the majority of neighbors won or lost by a margin smaller than 5%. Equation (2), below, summarizes our empirical strategy which is based on testing whether the impact of political alignment varies when the latter is interacted with other characteristics:

$$\begin{aligned} C_{is} = \alpha_0 + \alpha_1 Mwin_{is} + \textstyle\sum_{t=1}^{4}(\alpha_{2,t} Mwin * Sp_{is}^{t} + \alpha_{3,t}(1 - Mwin) * Sp_{is}^{t}) + \\ \alpha_4 Mwin_{is} * Y_{is} + \alpha_5 Sp_{is} * Y_{is} * Mwin_{is} + \alpha_6 Sp_{is} * Y_{is} * (1 - Mwin_{is}) + \delta X_{is}' + \gamma_s + \varepsilon_{is} \end{aligned} \tag{2}$$

The notation largely reproduces the one used in equation (1); however, because the specification is parametric, we include a fourth order polynomial of the vote spread on each side of the discontinuity. In addition, Y_{is} denotes each of the variables used to separately test each of the hypotheses spelled above, namely: (i) the share of neighboring municipalities governed by the party in power in most of them; (ii) a dummy variable indicating whether the party governing most of the neighbors is the PAN (in power at the federal level during the period of interest); (iii) a dummy variable indicating whether the party governing most of the neighbors is also in power at the state level; and (iv) a dummy variable indicating whether the party governing most of the neighbors is also the incumbent. In this context, the coefficient

α_4 captures whether the effect of the discontinuity on the outcome of interest varies with Y_{is}, while α_5 and α_6 account for the possibility that the same outcome varies smoothly, but in different ways, for municipalities with different Y_{is}.

Table 8 summarizes the results of this section. The first column reports the results for the baseline regression - including all controls but no interaction with Y_{is} - which represents our benchmark. The following columns report the results with the interaction terms for the share of neighboring municipalities governed by the same party (column 2), for the dummy for PAN ruling most of the neighbors (3), for the dummy for the party ruling most of the neighbors also controlling the state government (column 4) and for the dummy indicating if the party ruling most of the neighbors is also the incumbent.

In column 2 both the coefficient on political alignment with neighbors ($Mwin_{is}$) and the coefficient on its interaction with the share of neighboring municipalities governed by the same party are negative and large in magnitude. The sum of both coefficients is significantly different from zero at the 1% level. This result is consistent with the idea that the election of a mayor from a given party in a municipality is more likely to boost inter-jurisdictional cooperation the more of the neighboring mayors belong to that party. In column 3, political alignment with neighbors displays a negative and significant coefficient similar in magnitude with the one reported in column 1. However, the interaction between political alignment and the dummy indicating whether the party governing most of the neighbors is the same as the one in power at the federal level is not statistically significant. In column 4, political alignment with neighbors displays a negative coefficient similar in magnitude with the one reported in column 1; the interaction between political alignment and the dummy indicating whether the party governing most of the neighbors is the same as the one in power at the state level is also negative, smaller in magnitude and not statistically different from zero.

These findings suggest that the impact of political alignment with neighbors on crime reduction is independent from the degree of political alignment with federal or state authorities, and further support the view that the observed reduction in crime may be attributed to im-

proved horizontal rather than vertical cooperation. Finally column 5 also rejects the hypothesis that the reduction in homicide rates is driven by the fact that the incumbent party may be better at combating crime, for example because more experienced.

6. Conclusion

To what extent should policy-making be decentralized in a federal system? And what are the contrasting forces that should be considered when determining the optimal degree of decentralization? The academic debate around these crucial questions has been traditionally dominated by the fundamental trade-off between the necessity to adapt policies to local preferences, and the need to minimize possible inter-jurisdictional externalities (Oates, 1977). Any evaluation of the performance of a decentralized system, however, should also take into account how effective inter-jurisdictional cooperation can make the local provision of public goods more effective and less costly. This aspect, however, has been largely disregarded in the literature.

This paper attempts to fill this gap by investigating the impact of horizontal inter-jurisdictional cooperation in one policy area in which this aspect is especially important: law-enforcement. In particular we look at the context of Mexico and apply a Regression Discontinuity Design (RDD) to examine whether improved opportunities for cooperation in crime prevention among neighboring municipalities - proxied by their degree of political alignment - facilitates crime deterrence and results in lower crime rates. Our empirical strategy exploits the arguably exogenous discontinuity in the identity of the ruling party in a municipality given by its victory in a close election. To estimate the causal effect of political alignment, we compare the evolution of crime rates in municipalities where the party governing most of the municipality's neighbors won the election by a small margin to those in which it lost by a small margin.

We find that municipalities that are politically aligned with their neighbors experience sig-

nificantly lower homicide rates in the years following the election. This effect is sizeable - 25 to 40% reduction in murder rates - robust to various specifications and independent from the identity of the party in power in the neighboring municipalities. Furthermore, political alignment appears to have no impact on murder rates prior to the election, confirming that the treatment variable is not correlated with pre-election crime incidence. Finally, our findings do not provide support for alternative explanations based on the importance of political alignment with the ruling party at the state or federal levels further confirming the importance of horizontal over vertical cooperation.

Our research contributes to the crime literature by providing novel evidence that the effectiveness of decentralized law enforcement systems may crucially depend on the degree of inter-jurisdictional cooperation that can be supported under decentralization. It also contributes to the broader debate on decentralization by raising awareness that a thorough evaluation of the costs and benefits of decentralization should not only take into account the potential inefficiencies due to the presence of geographic spillover effects, but also the potential synergies from horizontal cooperation. Indeed, if the gains from cooperation are large enough, a centralized system which might be superior to a non-cooperative decentralized system may not be preferred to a cooperative decentralized one. Finally, our research provides new insights with regard to the role of political parties in democratic systems by documenting how party discipline may foster inter-jurisdictional cooperation and mitigate the inefficiencies of poorly designed decentralized systems.

REFERENCES

Brollo, F. and T. Nannicini (2011). Tying your enemy s hands in close races: The politics of federal transfers in brazil. *IZA Discussion Paper No. 5698*.

Caughey, D. and J. S. Sekhon (2011). Elections and the regression discontinuity design: Lessons from close us house races, 1942–2008. *Political Analysis 19*(4), 385–408.

Dal Bó, E., P. Dal Bó, and J. Snyder (2009). Political dynasties. *Review of Economic Studies 76*(1), 115–142.

Davis, D. E. (2006). Undermining the rule of law: Democratization and the dark side of police reform in mexico. *Latin American Politics and Society 48*(1), 55–86.

Dell, M. (2011). Trafficking networks and the mexican drug war.

Gonzalez-Navarro, M. (2008). Deterrence and geographical externalities in auto theft. Technical report, mimeo, Princeton University, Princeton.

Guerrero-Gutiérrez, E. (2010). Security, drugs and violence in mexico: A survey. In *San Miguel de Allende. Prepared for the Sixth North American Forum*.

Guillén López, T. (2006). Democracia representativa y participativa en los municipios de méxico: Procesos en tensión. *Andrew W. Selee and Leticia Santín del Río. Democracia y Ciudadanía: Participación Ciudadana y Deliberación Pública en Gobiernos Locales Mexicanos. Washington DC: Woodrow Wilson International Center for Scholars*.

Imbens, G. and K. Kalyanaraman (2012). Optimal bandwidth choice for the regression discontinuity estimator. *The Review of Economic Studies 79*(3), 933–959.

Imbens, G. and T. Lemieux (2008). Regression discontinuity designs: A guide to practice. *Journal of Econometrics 142*(2), 615–635.

Inman, R. P. (2007). Federalism's values and the value of federalism. *CESifo Economic Studies 53*(4), 522–560.

Inman, R. P. and D. L. Rubinfeld (1997). Rethinking federalism. *The Journal of Economic Perspectives 11*(4), pp. 43–64.

Knight, B. (2011). State gun policy and cross-state externalities: Evidence from crime gun tracing. Technical report, National Bureau of Economic Research.

Lee, D. and T. Lemieux (2009). Regression discontinuity designs in economics. Technical report, National Bureau of Economic Research.

Lee, D., E. Moretti, and M. Butler (2004a). Do voters affect or elect policies? evidence from the us house. *The Quarterly Journal of Economics 119*(3), 807–859.

Lee, D. S. (2001). The electoral advantage to incumbency and voters' valuation of politicians' experience: A regression discontinuity analysis of elections to the us.. Technical report, National Bureau of Economic Research.

Lee, D. S., E. Moretti, and M. J. Butler (2004b). Do voters affect or elect policies? evidence from the us house. *Quarterly Journal of Economics 119*(3), 807–859.

Loeper, A. (2011). Coordination in heterogeneous federal systems. *Journal of Public Economics*.

McDavid, J. C. (1974). Interjurisdictional cooperation among police departments in the st. louis metropolitan area. *Publius 4*(4), pp. 35–58.

Oates, W. (1977). *The political economy of fiscal federalism*. Lexington Books.

Oates, W. (1999). An essay on fiscal federalism. *Journal of economic literature 37*(3), 1120–1149.

Ostrom, E., R. Parks, and G. Whitaker (1978). *Patterns of metropolitan policing*. Ballinger Publishing Company.

Parks, R. (2009). Metropolitan organization and police. *The Practice of Constitutional Development, eds. FilippoSabetti, BarbaraAllen, and MarkSproule-Jones. Lanham, MD: Lexington Books*, 183–201.

Pettersson-Lidbom, P. (2008). Do parties matter for economic outcomes? a regression-discontinuity approach. *Journal of the European Economic Association 6*(5), 1037–1056.

Sabet, D. M. (2012). *Police reform in Mexico: informal politics and the challenge of institutional change*. Stanford University Press.

Soares, R. and I. Viveiros (2010). Organization and information in the fight against crime: An evaluation of the integration of police forces in the state of minas gerais, brazil.

Tapia, J. (2009a, June). Policías desquician calles de monterrey. *El Universal*.

Tapia, J. (2009b). Policías se corrompen por miedo y unas monedas. *El Universal*.

Wheaton, W. (2006). Metropolitan fragmentation, law enforcement effort and urban crime. *Journal of Urban Economics 60*(1), 1–14.

Figure 1: Total Monthly Registered Homicides in Mexico (2000-2010)

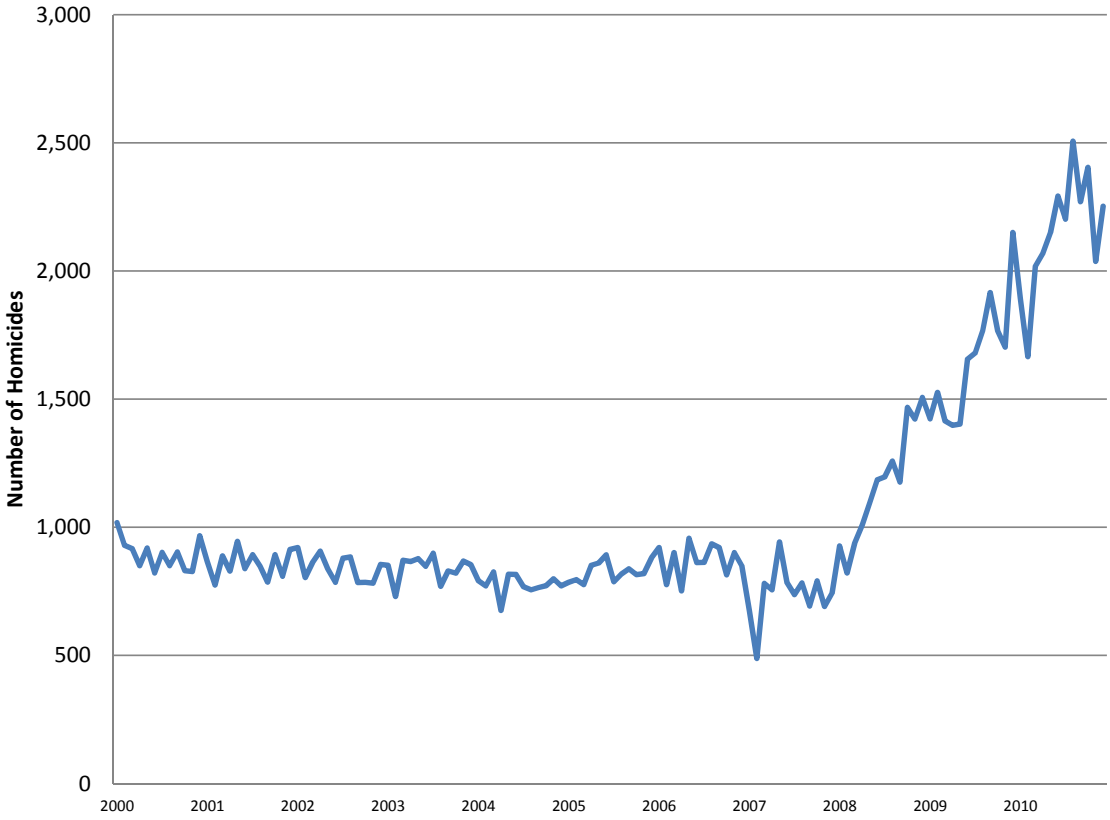

Figure 2: Municipalities by Mayor's Party Affiliation (2008)

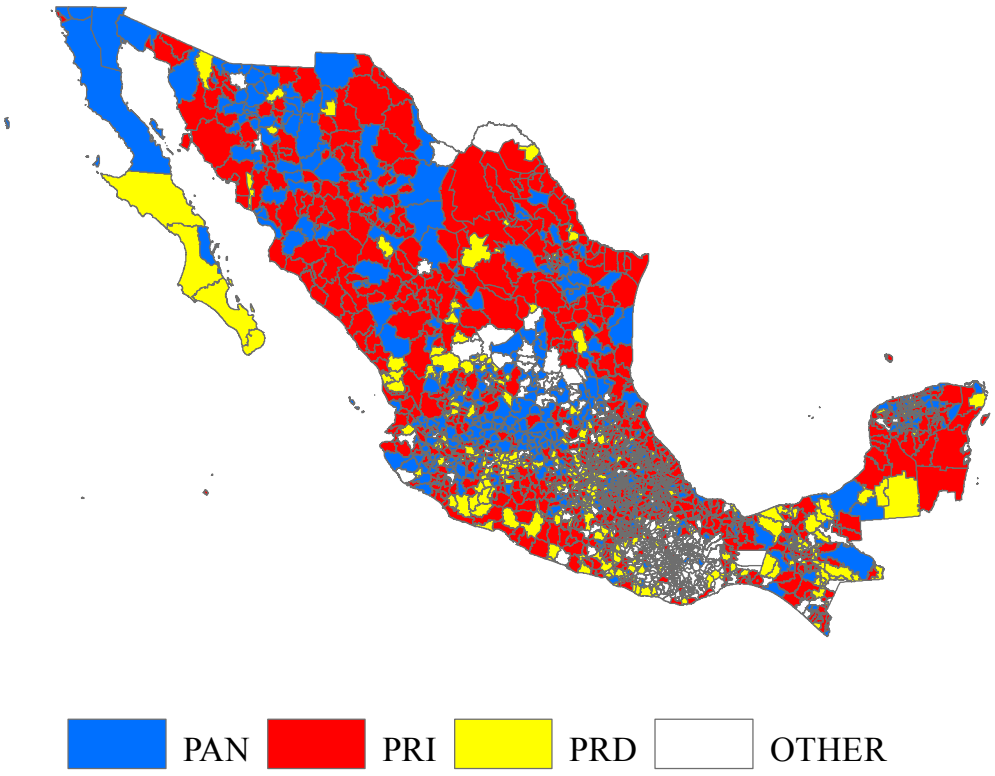

Figure 3: Example of Political Alignment with Neighboring Municipality

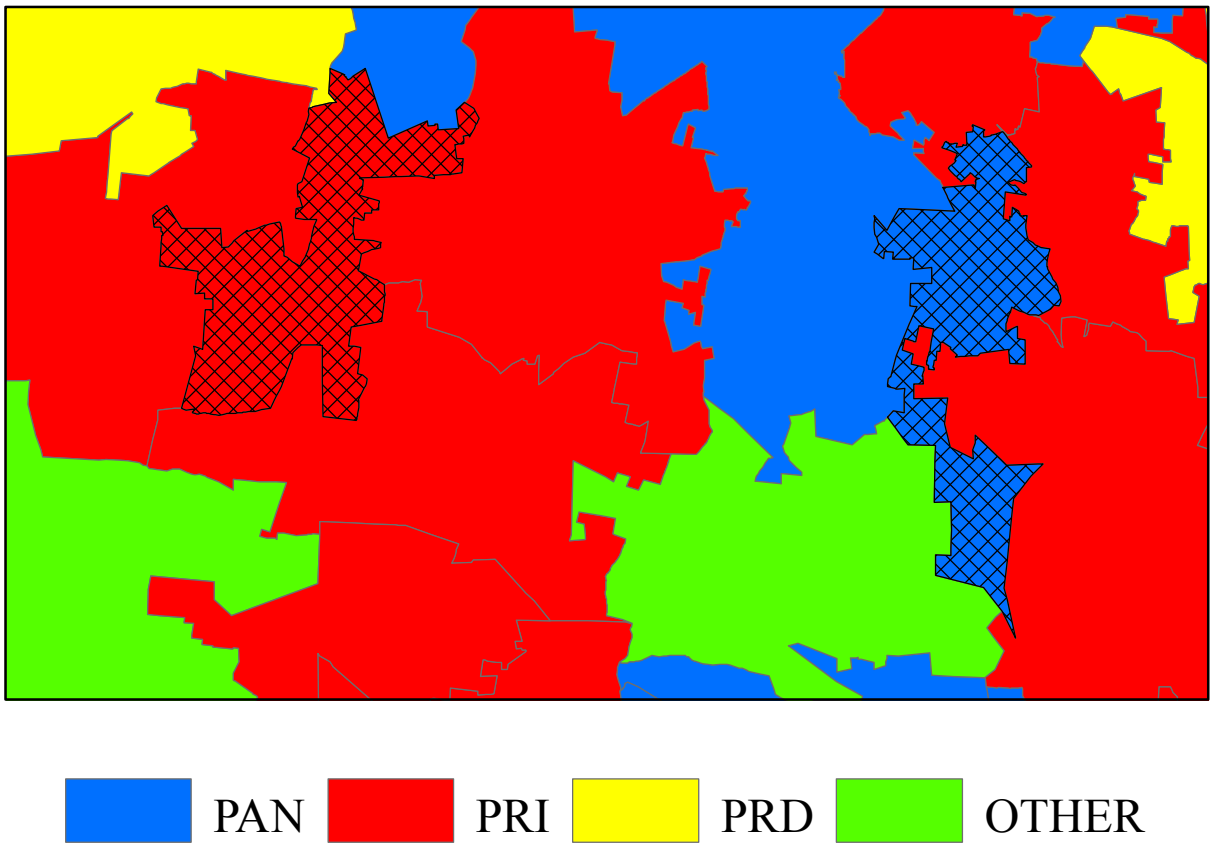

Figure 4: RDD Graphical Analysis

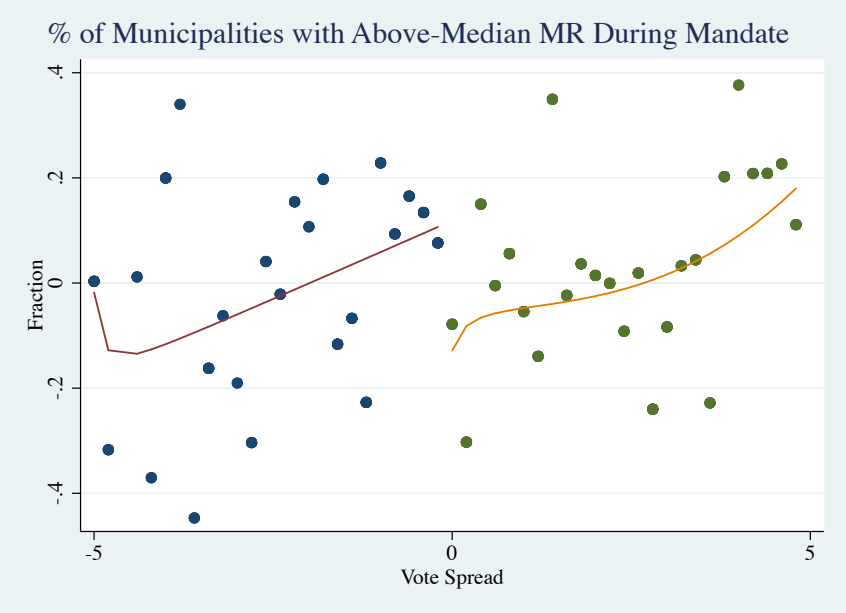

Figure 5: RDD Graphical Analysis

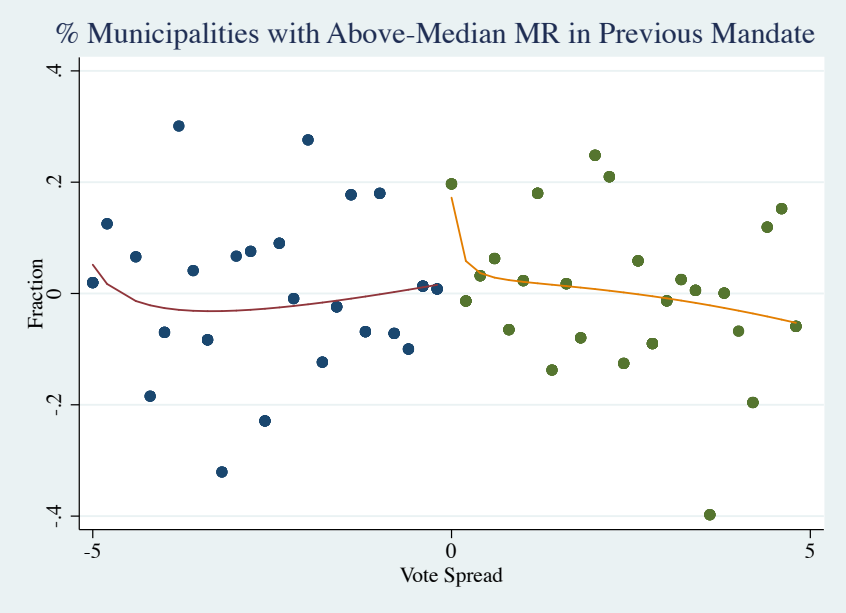

Figure 6: Distribution of Municipalities by Homicide Rate

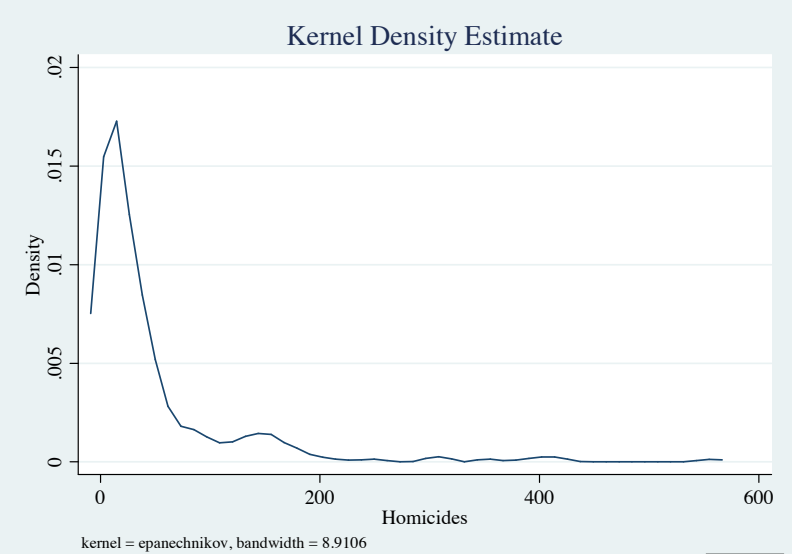

Table 1: Election Year by State

Election Year	State
2006	Aguascalientes, Campeche, Colima, Distrito Federal, Guanajuato, Jalisco, México, Morelos, Nuevo León, Querétaro, San Luis Potosí, Sonora, Tabasco
2007	Baja California, Chiapas, Chihuahua, Durango, Michoacán, Oaxaca, Puebla Sinaloa, Tamaulipas, Tlaxcala, Veracruz, Yucatán, Zacatecas
2008	Baja California Sur, Coahuila, Guerrero, Jalisco, Nayarit, Quintana Roo

Table 2: Descriptive Statistics (Overall vs. Restricted Sample)

Municipalities' Descriptive Statistics (Means)				
	Non Sample	*Sample*	*Difference*	*t-stat on means difference*
Homicide Rates Previous Mandate (per 100,000)	32.52	34.34	1.83	[0.53]
Homicide Rates (pero 100,000)	39.10	45.43	6.33	[1.49]
PAN affiliated winner	0.20	0.24	0.05	[1.82]*
PRI affiliated winner	0.42	0.53	0.11	[3.52]***
PRD affiliated winner	0.13	0.17	0.03	[1.57]
PAN affiliated governor	0.15	0.13	-0.02	[0.69]
PRI affiliated governor	0.69	0.68	-0.01	[0.18]
PRD affiliated governor	0.16	0.19	0.02	[0.88]
Majority of Neighbors PAN	0.14	0.15	0.01	[0.25]
Majority of Neighbors PRI	0.51	0.77	0.26	[8.31]***
Majority of Neighbors PRD	0.11	0.08	-0.03	[1.43]
Majority of Neighbors not identified	0.24	0.00	-0.24	[9.33]***
PAN affiliated incumbent	0.20	0.26	0.06	[2.19]**
PRI affiliated incumbent	0.40	0.51	0.12	[3.75]***
PRD affiliated incumbent	0.16	0.16	0.01	[0.31]
Share of Local Politicians that are Men	83.98	79.67	-4.31	[4.76]***
Population Density	0.00	0.00	0.00	[0.71]
Area (km2)	19	20	0	[5.01]***
Death Rates	569.07	546.95	-22.12	[1.71]*
Infant Mortality Rate	30.47	29.88	-0.59	[1.30]
Index of Human Development	0.70	0.72	0.01	[2.84]***
Adult Literacy Rate	81.39	82.96	1.57	[2.08]**
Percentage of HH with no sewage in 2005	9.88	12.06	2.18	[2.80]***
Percentage of HH with no electricity in 2005	5.50	5.09	-0.40	[0.79]
Percentage of HH with no water in 2005	17.71	16.29	-1.43	[1.13]
School Attendance	60.05	59.42	-0.64	[1.59]
Observations	2120	281		

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Homicides, Death rates, the adult literacy rate, the fraction of households with access to sewage, electricity and water and the school attendance rate for children aged 6 to 24 were obtained from the 2005 Conteo de Población y Vivienda. Infant mortality rates, the human development index and a variable indicating the percentage of local politicians that are women were taken from the UNDP statistics. The winner's and incumbent's identity was obtained from CIDAC electoral data. Total area was obtained from geographic data published by INEGI.

Table 3: Descriptive Statistics (Restricted Sample)

Restricted Sample Descriptive Statistics (Means)					
	Party in power in Majority of neighbors Lost by < 5%	*Party in power in Majority of neighbors Won by < 5%*	*t-stat on means difference*	*RD estimate*	*t-stat on RD estimate*
PAN affiliated governor	0.10	0.15	[1.17]		
PRI affiliated governor	0.71	0.67	[0.71]		
PRD affiliated governor	0.19	0.18	[0.17]		
Majority of Neighbors PAN	0.13	0.16	[0.79]	0.06	[0.62]
Majority of Neighbors PRI	0.77	0.77	[0.05]	0.04	[0.44]
Majority of Neighbors PRD	0.10	0.07	[1.11]	-0.09	[1.47]
PAN affiliated incumbent	0.22	0.29	[1.31]	0.04	[0.39]
PRI affiliated incumbent	0.49	0.53	[0.59]	0.11	[0.99]
PRD affiliated incumbent	0.19	0.15	[0.98]	-0.06	[0.78]
Share of Local Politicians that are Men	79.40	79.86	[0.27]	0.26	[0.08]
Population Density	228	201	[0.42]	105	[0.91]
Area (km2)	19.81	19.68	[0.71]	-0.30	[0.89]
Death Rates	524	563	[2.11]**	23	[0.67]
Infant Mortality Rate	30.33	29.57	[0.92]	-1.02	[0.67]
Index of Human Development	0.71	0.72	[1.00]	0.02	[1.00]
Adult Literacy Rate	82.39	83.36	[0.68]	1.03	[0.39]
Percentage of HH with no sewage in 2005	13.51	11.04	[1.44]	-3.99	[1.27]
Percentage of HH with no electricity in 2005	5.62	4.73	[0.90]	-0.60	[0.33]
Percentage of HH with no water in 2005	17.38	15.52	[0.83]	-2.28	[0.55]
School Attendance	59.42	59.41	[0.01]	1.14	[0.82]
Observations	116	165			

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: The RD estimate is the coefficient of the Majority Win variable in a regression of the variable in question against a linear spread on each side of the discontinuity and state fixed effects. Death rates, the adult literacy rate, the fraction of households with access to sewage, electricity and water and the school attendance rate for children aged 6 to 24 were obtained from the 2005 Conteo de Población y Vivienda. Infant mortality rates, the human development index and a variable indicating the percentage of local politicians that are women were taken from the UNDP statistics. The incumbent's identity was obtained from CIDAC electoral data. Total area was obtained from geographic data published by INEGI.

Table 4: Non-Parametric (local linear regression) RD Estimates

Dependent Variable: Dummy=1 if homicide rates during mandate > National Median during mandate

	Bandwidth					
	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*
Majority Wins	-0.374 [0.119]***	-0.427 [0.161]***	-0.375 [0.117]***	-0.389 [0.159]***	-0.351 [0.109]***	-0.357 [0.141]***
Controls A	Yes	Yes	Yes	Yes	Yes	Yes
Controls B			Yes	Yes	Yes	Yes
Controls C					Yes	Yes

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Optimal bandwidth from Imbens and Kalyanaraman (2009)

Controls A: state-level dummies, incumbent and winning party dummies
Controls B: death rate, area, pop. density, adult literacy rate, % households with access to sewage, electricity and water, IMR, HDI.
Controls C: school attendance rate for children aged 6 to 24, and share of local politicians that are women.

Table 5: Non-Parametric (local linear regression) RD Estimates

Dependent Variable: Dummy=1 if homicide rates previous mandate > National Median in previous mandate

	Bandwidth					
	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*
Majority Wins	0.116 [0.117]	0.145 [0.152]	0.108 [0.109]	0.152 [0.139]	0.073 [0.109]	0.11 [0.142]
Controls A	Yes	Yes	Yes	Yes	Yes	Yes
Controls B			Yes	Yes	Yes	Yes
Controls C					Yes	Yes

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Optimal bandwidth from Imbens and Kalyanaraman (2009)

Controls A: state-level dummies, incumbent and winning party dummies
Controls B: death rate, area, pop. density, adult literacy rate, % households with access to sewage, electricity and water, IMR, HDI.
Controls C: school attendance rate for children aged 6 to 24, and share of local politicians that are women.

Table 6: Non-Parametric (local linear regression) RD Estimates

Non-Parametric (local linear regression) RD Estimates						
Dependent Variable: Log (1 + homicide rates) during mandate						
	Bandwidth					
	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*
Majority Wins	-0.730 [0.407]*	-1.050 [0.563]*	-0.870 [0.388]**	-1.210 [0.566]**	-0.780 [0.371]**	-1.080 [0.527]**
Controls A	Yes	Yes	Yes	Yes	Yes	Yes
Controls B			Yes	Yes	Yes	Yes
Controls C					Yes	Yes

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Optimal bandwidth from Imbens and Kalyanaraman (2009)

Controls A: state-level dummies, incumbent and winning party dummies
Controls B: death rate, area, pop. density, adult literacy rate, % households with access to sewage, electricity and water, IMR, HDI.
Controls C: school attendance rate for children aged 6 to 24, and share of local politicians that are women.

Table 7: Non-Parametric (local linear regression) RD Estimates

Dependent Variable: Log of 1 + homicide rates in previous mandate

	Bandwidth					
	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*	*Optimal**	*(0.5)Opt*
Majority Wins	0.006 [0.268]	0.16 [0.351]	-0.048 [0.227]	-0.086 [0.292]	-0.083 [0.252]	-0.137 [0.338]
Controls A	Yes	Yes	Yes	Yes	Yes	Yes
Controls B			Yes	Yes	Yes	Yes
Controls C					Yes	Yes

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Optimal bandwidth from Imbens and Kalyanaraman (2009)

Controls A: state-level dummies, incumbent and winning party dummies
Controls B: death rate, area, pop. density, adult literacy rate, % households with access to sewage, electricity and water, IMR, HDI.
Controls C: school attendance rate for children aged 6 to 24, and share of local politicians that are women.

Table 8: OLS Regression Results

OLS Regression Results					
Dependent Variable: Dummy=1 if homicide rates during mandate > National Median					
	(1)	(2)	(3)	(4)	(5)
Majority Wins	-0.618 [0.243]**	-0.328 [0.360]	-0.695 [0.243]***	-0.55 [0.270]**	-0.666 [0.254]***
Majority Wins*Fraction Majority		-0.54 [0.501]			
Majority Wins if Majority is PAN			0.13 [0.385]		
Majority Wins if Majority Governs State				-0.139 [0.174]	
Majority Wins if Majority is Incumbent					0.033 [0.198]
Fourth Order Polynomial Spreads	Y	Y	Y	Y	Y
Differential Spread Controls		Y	Y	Y	Y
Controls A		Y	Y	Y	Y
Controls B		Y	Y	Y	Y
Controls C		Y	Y	Y	Y
Constant	-1.631 [1.770]	-1.247 [1.837]	-1.697 [1.805]	-1.516 [1.784]	-1.724 [1.825]
Observations	281	281	281	281	281
R-squared	0.46	0.46	0.46	0.46	0.47

Controls A: state-level dummies, incumbent and winning party dummies. Controls B: death rate, area, pop. density, adult literacy rate, % households with access to sewage, electricity and water, IMR, HDI. Controls C: school attendance rate for children aged 6 to 24, and share of local politicians that are women. Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.